

7003 H	SEQUENCE LISTING	
10>	Hahn, Gabriele	
<120>	Novel Virus Encoded Chemokines Determine the Tissue Tropism of Human Cytomegalovirus (HCMV)	
<130>	2923-0545	
<140> <141>	10/619,189 2003-07-15	
<160>	79	
<170>	PatentIn version 3.2	
<210> <211> <212> <213>	1 88 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> aaacca	1 cgtc ctcgtcacac gtcgttcgcg gacatagcaa gaaatccacg tcgccacatc	60
tcgaga	cgat ttattcaaca aagccacg	88
<210> <211> <212> <213>	88	
<220> <223>	oligonucleotide primer	
<400> aacggc	gtca ggtctttggg actcatgacg cgcggttttc aaaattccct gcgcgcgcga	60
cgggcg	ccag tgttacaacc aattaacc	88
	3 81 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400>	3	60

cggcga	ttta ttcaacaaag c	81
<210><211><211><212><213>	4 88 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> aacggc	4 gtca ggtctttggg actcatgacg cgcggttttc aaaattccct gcgcgcgcga	60
cgggcg	ccag tgttacaacc aattaacc	88
<210> <211> <212> <213>	5 82 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> tgcgttd	5 ctgt ggtgcgtctg gatctgtctc tcgacgtttc tgatagccat gttccatcga	60
cgattta	attc aacaaagcca cg	82
<210> <211> <212> <213>	6 81 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
	6 acat ccagccgttt gtgtttctta acgctctcca ggtactgatc caggcccacg	60
gccagto	gtta caaccaatta a	81
<210> <211> <212> <213>	7 81 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400>	7	60

cgattt	attc aacaaagcca c	81
<210><211><212><212><213>	8 81 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> aatatt	8 gatt tacgctatat aaccaatgac taatatggct aatggccaat attgatgcaa	60
gccagt	gtta caaccaatta a	81
<210> <211> <212> <213>		
<220> <223>	oligonucleotide primer	
<400> gactate	9 gtgc atgttcggct actgagctac cgaggcgacc ccctggtctt caagcacact	60
cgattt	attc aacaaagcca c	81
<210><211><211><212><212><213>	10 81 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> caccag	10 gtag gttatcaaaa cgcgagccca tatcgccgcc atcattgtaa tcagcaatgt	60
gccagt	gtta caaccaatta a	81
<210> <211> <212> <213>	DNA	
<220> <223>	oligonucleotide primer	
<400>	11	

acgtcc	togt cacaegiegt tegeggaeat ageaagaaat teaegiegee aegietegag	60
acgatt	tatt caacaaagcc a	81
<210> <211> <212> <213>	12 84 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> aaggtto	12 cttc catttccgag gcggtcagtt catcgtacac cgagacgtag tacctgatgg	60
ggccagt	tgtt acaaccaatt aacc	84
<210> <211> <212> <213>	13 76 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> tgtctti	13 tegg ttecaactet tteceegeee cateaceteg eetgtactat gtgtegattt	60
attcaad	caaa gccacg	76
<210> <211> <212> <213>	14 87 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> tcgcgcg	14 gaca tgaatttagt cggcgacaga aatctcgaaa cgcgtatttc ggacaaacac	60
acatgc	cagt gttacaacca attaacc	87
<210> <211> <212> <213>	15 90 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	

<400> cgctgta	15 aggg ataaatagtg cgatggcgtt tgtgggagaa cgcagtagcg atgggttgcg .	60
acgtgca	accg atttattcaa caaagccacg	90
<210> <211> <212> <213>	16 81 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> caccago	16 gtag gttatcaaaa cgcgagccca tatcgccgcc atcattgtaa tcagcaatgt	60
gccagto	gtta caaccaatta a	81
<210> <211> <212> <213>	17 81 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> cagtcto	17 gcaa catgcggctg tgctgggtgt ggctgtctgt ttgtctgtgc gccgtggtgc	60
cgattta	attc aacaaagcca c	81
<210> <211> <212> <213>	18 74 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> gctagti	18 tggc aaagagccgc acgctgaact cgaggctccg ggcgtgtggc ggccagtgtt	60
acaacca	aatt aacc	74
<210> <211> <212> <213>	19 83 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	

<400> 19) Ig gaataccgga	tattacgaat	tactggtagt	gacgtagata	ataaaattat	60
acgatttat	t caacaaagcc	acg				83
<210> 20 <211> 76 <212> DN <213> Ar	; ·	lence '				
<220> <223> ol	.igonucleotide	e primer				
<400> 20 caccaaago	c gttagcgtgc	ccagagctac	cgcacggtaa	aatagggaca	tgagccagtg	60
ttacaacca	a ttaacc					76
<210> 21 <211> 40 <212> DN <213> Hu	8	lovirus				
<400> 21 gtctgcaac	a tgcggctgtc	tcgggtgtgg	ctgtctgttt	gtctgtgcgc	cgtggtgctg	60
ggtcagtgc	c agcgggagac	cgcagaaaaa	aacgattatt	accgagtacc	gcattactgg	120
gacgcgtgc	t ctcgcgcgct	gcctgaccaa	acccgttaca	agtatgtgga	acagctcgtg	180
gacctcacc	t tgaactacca	ctacgatgcg	agccacggct	tggacaactt	tgacgtgctc	240
aagagaato	a acgtgaccga	ggtgtcgttg	ctcatcagcg	actttatacg	tcagaaccgt	300
cgcggcggc	a ccaacaaaag	gaccacgttc	aacgccgccg	gttcgctggc	gcctcacgcc	360
cggagcctc	g agttcagcgt	gcggctcttt	gccaactagc	ctgcgtca	,	408
<210> 22 <211> 51 <212> DN <213> Hu	.6	lovirus	-		•	
<400> 22	: :a tgcggctgtg	teggatataa	ctatctattt	atctatacac	cataatacta	60
	cc agcgggagac					120
	ct ctcgcgcgct					180
	gt tgaactacca					240

aagaggtgag ggtacgcgct aaagg	gtgtat gacaacggga	aggtaagggc	gaacgggtaa	300
cgggtaggta accgcatggg gtgtg	gaaatg acgttcggaa	cctgtgcttg	cagaatcaac	360
gtgaccgagg tgtcgttgct catca	agcgac tttagacgtc	agaaccgtcg	cggcggcacc	420
aacaaaagga ccacgttcaa cgccg	geeggt tegetggege	ctcacgcccg	gagcctcgag	480
ttcagcgtgc ggctctttgc caact	tageet gegtea			516
<210> 23 <211> 410 <212> DNA <213> Human cytomegaloviru	15			
<400> 23 gtctgcaaca tgcggctgtg tcggg	gtgtgg ctgtctgttt	gtctgtgcgc	cgtggtgctg	60
ggtcagtgcc agcgggagac cgcag	gaaaaa aaaacgatta	ttaccgagta	ccgcattact	120
gggacgcgtg ctctcgcgcg ctgcc	ctgacc aaacccgtta	caagtatgtg	gaacagctcg	180
tggacctcac gttgaactac cacta	acgatg cgagccacgg	cttggacaac	tttgacgtgc	240
tcaagagaat caacgtgacc gaggt	gtcgt tgctcatcag	cgactttaga	cgtcagaacc	300
gtcgcggcgg caccaacaaa aggac	ccacgt tcaacgccgc	cggttcgctg	gcgcctcacg	360
cccggagcct cgagttcagc gtgcg	ggctct ttgccaacta	gcctgcgtca		410
<210> 24 <211> 516 <212> DNA <213> Human cytomegaloviru	1 s	·		
<400> 24 gtctgcaaca tgcggctgtg tcggc	rtataa ctatctattt	atctatacac	cataatacta	60
ggtcagtgcc agcgggagac cgcag				120
gacgcgtgct ctcgcgcgct gcctg				180
gacctcacgt tgaactacca ctacg	gatgcg agccacggct	tggacaactt	tgacgtgctc	240
aagaggtgag ggtacgcgct aaagg	gtgtat gacaacggga	aggtaagggc	gaacgggtaa	300
cgggtaggta accgcatggg gtgtg	gaaatg acgttcggaa	cctgtgcttg	cagaatcaac	360
gtgaccgagg tgtcgttgct catca	agcgac tttagacgtc	agaaccgtcg	cggcggcacc	420
aacaaaagga ccacgttcaa cgcc	geeggt tegetggege	ctcacgcccg	gagcctcgag	480

- <210> 25 <211> 656 <212> DNA <213> Human cytomegalovirus
- <400> 25 60 ccgtgcgtca tgagtcccaa aaacctgacg ccgttcttga cggcgttgtg gctgctattg 120 ggtcacagcc gcgtgccgcg ggtacgcgca gaagaatgtt gcgaattcat aaacgtcaac caccegeegg aacgetgtta egattteaaa atgtgeaate getteaeegt egegtaegta 180 ttttcatgat tgtctgcgtt ctgtggtgcg tctggatctg tctctcgacg tttctgatag 240 300 ccatgttcca tcgacgatcc tcgggaatgc cagagtagat tttcatgaat ccacaggctg 360 cggtgtccgg acggcgaagt ctgctacagt cccgagaaaa cggctgagat tcgcgggatc gtcaccacca tgacccattc attgacacgc caggtcgtac acaacaaact gacgaactgc 420 480 aactacaatc cgttatacct cgaagctgac gggcgaatac gctgcggcaa agtgaacgac 540 aaggcgcagt acctgctggg cgccgctggc agcgttccct atcgatggat caacctggaa 600 tacgacaaga taacccggat cgtgggcctg gatcagtacc tggagagcgt taagaaacac aaacggctgg atgtgtgccg cgctaaaatg ggctatatgc tgcagtgaat aataaa 656
- <210> 26 <211> 656 <212> DNA <213> Human cytomegalovirus

<400> 26 60 ccgcgcgtca tgagtcccaa aaacctgacg ccgttcttga cggcgttgtg gctgctattg-120 ggtcacagcc gcgtgccgcg ggtacgcgca gaagaatgtt gcgaattcat aaacgtcaac 180 cacccgccgg aacgctgtta cgatttcaaa atgtgcaatc gcttcaccgt cgcgtacgta ttttcatgat tgtctgcgtt ctgtggtgcg tctggatctg tctctcgacg tttctgatag 240 300 ccatgttcca tcgacgatcc tcgggaatgc cagagtagat tttcatgaat ccacaggctg 360 cggtgtccgg acggcgaagt ctgctacagt cccgagaaaa cggctgagat tcgcgggatc 420 gtcaccacca tgacccattc attgacacgc caggtcgtac acaacaaact gacgagctgc aactacaatc cgttatacct cgaagctgac gggcgaatac gctgcggcaa agtgaacgac 480 540 aaggcgcagt acctgctggg cgccgctggc ggcgttccct atcgatggat caacctggaa

tacgacaaga tagcccggat (cgtgggcctg	gatcagtacc	tggagagcgt	taagaaacac	600
aaacggctgg atgtgtgccg	cgctaaaatg	ggctatatgc	tgcagtgaat	aataaa	656
<210> 27 <211> 533 <212> DNA <213> Human cytomegalo	ovirus				
<400> 27 ccgcgcgtca tgagtcccaa a	aaacctgacg	ccgttcttga	cggcgttgtg	gctgctattg	60
ggtcacagee gegtgeegeg g	ggtacgcgca	gaagaatgtt	gcgaattcat	aaacgtcaac	120
cacccgccgg aacgctgtta o	cgatttcaaa	atgtgcaatc	gcttcaccgt	cgcgctgcgg	180
tgtccggacg gcgaagtctg o	ctacagtccc	gagaaaacgg	ctgagattcg	cgggatcgtc	240
accaccatga cccattcatt q	gacacgccag	gtcgtacaca	acaaactgac	gagctgcaac	300
tacaatctgt tatacctcga a	agctgacggg	cgaatacgct	gcggcaaagt	gaacgacaag	360
gcgcagtacc tgctgggcgc (cgctggcagc	gttccctatc	gatggatcaa	cctggaatac	420
gacaagataa cccggatcgt g	gggcctggat	cagtacctgg	agagcgttaa	gaaatacaaa	480
cggctggatg tgtgccgcgc t	taaaatgggc	tatatgctgc	agtgaataat	aaa	533
<210> 28 <211> 775 <212> DNA <213> Human cytomegalo	ovirus				
<400> 28 ccgcgcgtca tgagtcccaa a	aaacctgacg	ccattettaa	caacattata	actactatta	60
ggtcacagcc gcgtgccgcg		•			120
cacccgccgg aacgctgtta					180
tttttatgat tgtctgcgtt (•	240
ccatgttcca tcgacgatcc 1					300
cggtgtccgg acggcgaagt (360
gtcaccacca tgacccattc a	attgacacgc	caggtcgtac	acaacaaact	gacgagctgc	420
aactacaatc cgtaagtctc	ttcctcgagg	gccttacagc	ctatgggaaa	gtaagacaga	480
gggacaaaac atcattaaaa a	aaaaagtcta	atttcacgtt	ttgtaccccc	ccttcccctc	540

cgtgttgtag gttatacctc gaagctgacg	ggcgaatacg	ctgcggcaaa	gtgaacgaca	600
aggcgcagta cctgctgggc gccgctggca	gcgttcccta	tcgatggatc	aacctggaat	660
acgacaagat aacccggatc gtgggcctgg	atcagtacct	ggagagcgtt	aagaaacaca	720
aacggctgga tgtgtgccgc gctaaaatgg	gctatatgct	gcagtgaata	ataaa	775
<210> 29 <211> 60 <212> DNA <213> Human cytomegalovirus <400> 29				60
cgctaaaatg ggctatatgc tgcagtgaat	aataaaatgt	gtgtttgtcc	gcaaaaaaaa	60
<210> 30 <211> 60 <212> DNA <213> Human cytomegalovirus				
<400> 30 cgctaaaatg ggctatatgc tgcagtgaat	aataaaatgt	gtgtttgtcc	aaaaaaaaa	60
	-			
<210> 31 <211> 60 <212> DNA <213> Human cytomegalovirus				
<400> 31 cgctaaaatg ggctatatgc tgcagtgaat	aataaaatαt	atatttatcc	aaaaaaaaa	60
	,			
<210> 32 <211> 52 <212> DNA <213> Human cytomegalovirus				
<400> 32			·	
cgctaaaatg ggctatatgc tgcagtgaat	aataaaatgt	gtgtttgtcc	ga	52
<210> 33 <211> 1977 <212> DNA <213> Human cytomegalovirus				
<400> 33 gtctgcaaca tgcggctgtg tcgggtgtgg	ctgtctgttt	gtctgtgcgc	cgtggtgctg	60
datcautace adeddaaaac cacadaaaaa	aacqattatt	accasatacc	acettectaa	120

180 gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 240 gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 300 aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360 gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 420 480 aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag 540 ttcagcgtgc ggctctttgc caactagcct gcgtcacggg aaataatatg ctacggcttc tgcttcgtca ccactttcac tgcctgcttc tgtgcgcggt ttgggcaacg ccctgtctgg 600 660 cgtctccgtg gttcacgcta acggcgaacc agaatccgtc cccgccatgg tctaaactga 720 cgtatcccaa accgcatgac gcggcgacgt tttactgtcc ttttctctat ccctcgcccc cacggtcccc ctcgcaattc ccggggttcc agcgggtatc aacgggtccc gagtgtcgca 780 840 acqaqaccct gtatctgctg tacaaccggg aaggccagac cttggtggag agaagctcca 900 cctgggtgaa aaaggtgatc tggtatctga gcggtcgcaa tcagaccatc ctccaacgga 960 tgccccgaac ggcttcgaaa ccgagcgacg gaaacgtgca gatcagcgtg gaagacgcca agatttttgg agcgcacatg gtgcccaagc agaccaagct gctacgtttc gtcgtcaacg 1020 1080 atggcacacg ttatcagatg tgtgtgatga aactggagag ctgggcccac gtcttccggg 1140 actacagcgt gtcttttcag gtgcgattga cgttcaccga ggccaataac cagacttaca 1200 ccttctgcac ccatcccaat ctcatcgttt gagcccgtcg cgcgcgcagg gaattttgaa 1260 aaccgcgcgt catgagtccc aaaaacctga cgccgttctt gacggcgttg tggctgctat 1320 tgggtcacag ccgcgtgccg cgggtacgcg cagaagaatg ttgcgaattc ataaacgtca 1380 accaccegee ggaacgetgt tacgatttea aaatgtgcaa tegetteace gtegegtaeg 1440 tattttcatg attgtctgcg ttctgtggtg cgtctggatt tgtctctcga cgtttctgat 1500 agccatgttc catcgacgat cctcgggaat gccagagtag attttcatga atccacaggc 1560 tgcggtgtcc ggacggcgaa gtctgctaca gtcccgagaa aacggctgag attcgcggga 1620 tegteaceae catgacecat teattgacae gecaggtegt acaeaacaaa etgacgaget gcaactacaa toogtaagto tottootoga gggoottaca gootatggga aagtaagaca 1680 1740 gagggacaaa acatcattaa aaaaaaagtc taatttcacg ttttgtaccc ccccttcccc 1800 tccgtgttgt aggttatacc tcgaagctga cgggcgaata cgctgcggca aagtgaacga

caaggcgcag tacctgctgg gcgccgctgg cagcgttccc tatcgatgga tcaacctgga 1860
atacgacaag ataacccgga tcgtgggcct ggatcagtac ctggagagcg ttaagaaaca 1920
caaacggctg gatgtgtgcc gcgctaaaat gggctatatg ctgcagtgaa taataaa 1977

<210> 34

<211> 129

<212> PRT

<213> Human cytomegalovirus

<400> 34

Met Arg Leu Cys Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$

Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg
20 25 30

Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr 35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His 50 55 60

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg Ile 70 75 80

Asn Val Thr Glu Val Ser Leu Leu Ile Ser Asp Phe Arg Arg Gln Asn 85 90 95

Arg Arg Gly Gly Thr Asn Lys Arg Thr Thr Phe Asn Ala Ala Gly Ser 100 105 110

Leu Ala Pro His Ala Arg Ser Leu Glu Phe Ser Val Arg Leu Phe Ala 115 120 125

Asn

<210> 35

<211> 30

<212> DNA

<213> Artificial Sequence

<220> <223>	oligonucleotide primer	
<400>	35	•
cggcaca	acat ccagccgttt gtgtttctta	30
<210>	36	
<211>	30	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	oligonucleotide primer	
<400>	36	
taacgct	cete caggtaetga tecaggeeca	30
<210>	37	
<211>	30	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	oligonucleotide primer	
<400>	37	
tcgtcag	gttt gttgtgtacg acctggcgtg	30
<210>	38	
<211>	30	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	oligonucloetide primer	
<400>	38	
	cctc ggtgaacgtc aatcgcacct	30
caccgg	gg cguaeg co uu ceg cueec	
<210>	39	
<211>	30	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	oligonucleotide primer	
-220/	orrangement of the primer	
<400>	39	2.0
tgtgtc	gggt gtggctgtct gtttgtctgt	30

```
<210>
       40
<211>
       30
<212>
      DNA
<213> Artificial Sequence
<220>
<223> oligonucleotide primer
<400> 40
                                                                      30
tctgcttcgt caccactttc actgcctgct
<210> 41
<211> 30
<212>
      DNA
<213>
      Artificial Sequence
<220>
<223> oligonucleotide primer
<400>
      41
cgcagaagaa tgttgcgaat tcataaacgt
                                                                      30
<210> 42
<211>
      30
<212> DNA
<213> Artificial Sequence
<220>
<223> oligonulceotide primer
<400> 42
                                                                      30
gctgcggtgt ccggacggcg aagtctgcta
<210> 43
<211>
       30
<212> DNA
<213> Artificial Sequence
<220>
<223> oligonucleotide primer
<400>
       43
                                                                      30
ccagctggca gattcccaaa ctaatgaaag
<210>
       44
<211>
       30
<212>
<213>
       Artificial Sequence
<220>
```

<223>	oligonucleotide primer	
<400> ctttcg	44 gttc caactctttc cccgccccat	30
<210>	45	
<211> <212> <213>	30 DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400>	·	30
		50
<210> <211> <212>	30 DNA	
<213> <220>	Artificial Sequence	
<223> <400>	oligonucleotide primer	
	ttct cagtctgcaa catgcggctg	30
<210> <211>	47 30	
<212> <213>	DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400> gttgtc	47 caag ccgtcgctcg catcgtagtg	30
<210> <211>	48 30	
<212> <213>	DNA Artificial Sequence	
<220> <223>	oligonucleotide primer	
<400>	48 aaag ctctctttct cagtctgcaa	30
<210>	49	
\~ ± U/		

```
<211>
       30
<212>
       DNA
<213>
      Artificial Sequence
<220>
<223>
      oligonucleotide primer
<400>
       49
                                                                        30
tatgatgtct cataataaag ctctctttct
<210>
       50
<211>
       390
<212>
       DNA
<213>
      Human cytomegalovirus
<400>
       50
                                                                        60
atgcqqctqt ctcqqqtqtq qctqtctqtt tgtctgtgcg ccgtggtgct gggtcagtgc
                                                                       120
cagcqqqaqa ccqcagaaaa aaacgattat taccgagtac cqcattactg ggacqcqtqc
tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg
                                                                       180
ttgaactacc actacqatqc gaqccacqqc ttggacaact ttgacgtgct caagagaatc
                                                                       240
                                                                       300
aacqtqaccq aggtqtcqtt gctcatcagc gactttatac gtcagaaccg tcgcggcggc
accaacaaaa ggaccacgtt caacgccgcc ggttcgctgg cgcctcacgc ccggagcctc
                                                                       360
gagttcagcg tgcggctctt tgccaactag
                                                                       390
<210>
       51
<211>
       129
<212>
       PRT
<213>
      Human cytomegalovirus
<400>
       51
Met Arg Leu Ser Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val
                                     10
Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg
            20
                                 25
                                                     30
Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr
                                                 45
        35
                             40
Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His
```

55

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg Ile 75 70 Asn Val Thr Glu Val Ser Leu Leu Ile Ser Asp Phe Ile Arg Gln Asn 90 95 85 Arg Arg Gly Gly Thr Asn Lys Arg Thr Thr Phe Asn Ala Ala Gly Ser Leu Ala Pro His Ala Arg Ser Leu Glu Phe Ser Val Arg Leu Phe Ala Asn <210> 52 <211> 240 <212> DNA <213> Human cytomegalovirus <400> 52 atgcggctgt gtcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60 cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 120 180 totogogogo tgcctgacca aaccogttac aagtatgtgg aacagctcgt ggacctcacg ttgaactacc actacqatqc qaqccacqqc ttggacaact ttgacqtqct caagaggtga 240 <210> 53 <211> 79 <212> PRT <213> Human cytomegalovirus <400> 53 Met Arg Leu Cys Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val 5 Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg 25 20 Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr 35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His

50 55 60

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg 70 75

<210> 54 <211> 1977

<212> DNA

<213> Human cytomegalovirus

<400> 54

60 gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 120 ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 180 gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 240 gacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa 300 360 cqqqtaqqta accqcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 420 gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 480 aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag ttcagcgtgc ggctctttgc caactagcct gcgtcacggg aaataatatg ctacggcttc 540 tgcttcgtca ccactttcac tgcctgcttc tgtgcgcggt ttgggcaacg ccctgtctgg 600 660 cgtctccgtg gttcacgcta acggcgaacc agaatccgtc cccgccatgg tctaaactga 720 cgtatcccaa accgcatgac gcggcgacgt tttactgtcc ttttctctat ccctcgcccc cacggtcccc ctcgcaattc ccggggttcc agcgggtatc aacgggtccc gagtgtcgca 780 840. acgagaccct gtatctgctg tacaaccggg aaggccagac cttggtggag agaagctcca 900 cctgggtgaa aaaggtgatc tggtatctga gcggtcgcaa tcagaccatc ctccaacgga 960 tgccccgaac ggcttcgaaa ccgagcgacg gaaacgtgca gatcagcgtg gaagacgcca agatttttgg agcgcacatg gtgcccaagc agaccaagct gctacgtttc gtcgtcaacg 1020 1080 atggcacacg ttatcagatg tgtgtgatga aactggagag ctgggcccac gtcttccggg actacagcgt gtcttttcag gtgcgattga cgttcaccga ggccaataac cagacttaca 1140 ccttctgcac ccatcccaat ctcatcgttt gagcccgtcg cgcgcgcagg gaattttgaa 1200 1260 aaccgcgcgt catgagtccc aaaaacctga cgccgttctt gacggcgttg tggctgctat

1320 tgggtcacag ccgcgtgccg cgggtacgcg cagaagaatg ttgcgaattc ataaacgtca 1380 accaccegce ggaacgetgt tacgatttca aaatgtgcaa tegettcace gtegegtacg 1440 tattttcatg attgtctgcg ttctgtggtg cgtctggatt tgtctctcga cgtttctgat 1500 agccatgttc catcgacgat cctcgggaat gccagagtag attttcatga atccacaggc 1560 tgcggtgtcc ggacggcgaa gtctgctaca gtcccgagaa aacggctgag attcgcggga 1620 tegteaceae catgacecat teattgacae gecaggtegt acacaacaaa etgacgaget 1680 gcaactacaa teegtaagte tetteetega gggeettaca geetatggga aagtaagaca gagggacaaa acatcattaa aaaaaaagtc taatttcacg ttttgtaccc ccccttcccc 1740 1800 tccgtgttgt aggttatacc tcgaagctga cgggcgaata cgctgcggca aagtgaacga 1860 caaggcgcag tacctgctgg gcgccgctgg cagcgttccc tatcgatgga tcaacctgga 1920 atacgacaag ataacccgga tcgtgggcct ggatcagtac ctggagagcg ttaagaaaca caaacggctg gatgtgtgcc gcgctaaaat gggctatatg ctgcagtgaa taataaa 1977

<210> 55

<211> 1741

<212> DNA

<213> Human cytomegalovirus

<400> 55

atgcggctgt ctcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60 120 cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 180 tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagagaatc 240 300 aacgtgaccg aggtgtcgtt gctcatcagc gactttatac gtcagaaccg tcgcggcggc accaacaaaa ggaccacgtt caacgccgcc ggttcgctgg cgcctcacgc ccggagcctc 360 420 gagttcagcg tgcggctctt tgccaactag cctgcgtcac gggaaataat atgctacggc ttctgcttcg tcaccacttt cactgcctgc ttctgtgcgc ggtttgggca acgccctgtc 480 540 tggcgtctcc gtggttcacg ctaacggcga accagaatcc gtccccgcca tggtctaaac tgacgtatcc caaaccgcat gacgcggcga cgttttactg tccttttctc tatccctcgc 600 ccccacggtc cccctcgcaa ttcccggggt tccagcgggt atcaacgggt cccgagtgtc 660 720 gcaacgagac cctgtatctg ctgtacaacc gggaaggcca gaccttggtg gagagaagct

ccacctgggt	gaaaaaggtg	atctggtatc	tgagcggtcg	caatcagacc	atcctccaac	780
ggatgccccg	aacggcttcg	aaaccgagcg	acggaaacgt	gcagatcagc	gtggaagacg	840
ccaagatttt	tggagcgcac	atggtgccca	agcagaccaa	gctgctacgt	ttcgtcgcca	900
acgatggcac	acgttatcag	atgtgtgtga	tgaaactgga	gagctgggcc	cacgtcttcc	960
gggactacag	cgtgtctttt	caggtgcgat	tgacgttcac	cgaggccaat	aaccagactt	1020
acaccttctg	cacccatccc	aatctcatcg	tttgagcccg	tcgcgcgcgc	agggaatttt	1080
gaaaaccgtg	cgtcatgagt	cccaaaaacc	tgacgccgtt	cttgacggcg	ttgtggctgc	1140
tattgggtca	cagccgcgtg	ccgcgggtac	gcgcagaaga	atgttgcgaa	ttcataaacg	1200
tcaaccaccc	gccggaacgc	tgttacgatt	tcaaaatgtg	caatcgcttc	accgtcgcgt	1260
acgtattttc	atgattgtct	gcgttctgtg	gtgcgtctgg	atctgtctct	cgacgtttct	1320
gatagccatg	ttccatcgac	gatcctcggg	aatgccagag	tagattttca	tgaatccaca	1380
ggctgcggtg	tccggacggc	gaagtctgct	acagtcccga	gaaaacggct	gagattcgcg	1440
ggatcgtcac	caccatgacc	cattcattga	cacgccaggt	cgtacacaac	aaactgacga	1500
actgcaacta	caatccgtta	tacctcgaag	ctgacgggcg	aatacgctgc	ggcaaagtga	1560
acgacaaggc	gcagtacctg	ctgggcgccg	ctggcagcgt	tccctatcga	tggatcaacc	1620
tggaatacga	caagataacc	cggatcgtgg	gcctggatca	gtacctggag	agcgttaaga	1680
aacacaaacg	gctggatgtg	tgccgcgcta	aaatgggcta	tatgctgcag	tgaataataa	1740
a						1741

<210> 56

<400> 56

<211> 390

<212> DNA

<213> Human cytomegalovirus

<210> 57

<211> 129

<212> PRT

<213> Human cytomegalovirus

<400> 57

Met Arg Leu Ser Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val 1 5 10 15

Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg 20 25 30

Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr 35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His 50 55 60

Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg Ile 65 70 75 80

Asn Val Thr Glu Val Ser Leu Leu Ile Ser Asp Phe Ile Arg Gln Asn 85 90 95

Arg Arg Gly Gly Thr Asn Lys Arg Thr Thr Phe Asn Ala Gly Ser 100 105 110

Leu Ala Pro His Ala Arg Ser Leu Glu Phe Ser Val Arg Leu Phe Ala 115 120 125

Asn

<210> 58

<211> 1977

<212> DNA

<213> Human cytomegalovirus

<400> 58

gtctgcaaca tgcggctgtg tcgggtgtgg ctgtctgttt gtctgtgcgc cgtggtgctg 60 ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120

180 gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 240 qacctcacgt tgaactacca ctacgatgcg agccacggct tggacaactt tgacgtgctc 300 aagaggtgag ggtacgcgct aaaggtgtat gacaacggga aggtaagggc gaacgggtaa cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360 420 gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 480 aacaaaagga ccacgttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag ttcagcgtgc ggctctttgc caactagcct gcgtcacggg aaataatatg ctacggcttc 540 600 tgcttcgtca ccactttcac tgcctgcttc tgtgcgcggt ttgggcaacg ccctgtctgg 660 cgtctccgtg gttcacgcta acggcgaacc agaatccgtc cccgccatgg tctaaactga 720 cgtatcccaa accgcatgac gcggcgacgt tttactgtcc ttttctctat ccctcgcccc cacggtcccc ctcgcaattc ccggggttcc agcgggtatc aacgggtccc gagtgtcgca 780 840 acgagaccct gtatctgctg tacaaccggg aaggccagac cttggtggag agaagctcca 900 cctgggtgaa aaaggtgatc tggtatctga gcggtcgcaa tcagaccatc ctccaacgga 960 tgccccgaac ggcttcgaaa ccgagcgacg gaaacgtgca gatcagcgtg gaagacgcca agatttttgg agcgcacatg gtgcccaagc agaccaagct gctacgtttc gtcgtcaacg 1020 1080 atggcacacg ttatcagatg tgtgtgatga aactggagag ctgggcccac gtcttccggg 1140 actacagcgt gtcttttcag gtgcgattga cgttcaccga ggccaataac cagacttaca 1200 cettetgeae ceateceaat eteategttt gageeegteg egegegeagg gaattttgaa aaccgcgcgt catgagtccc aaaaacctga cgccgttctt gacggcgttg tggctgctat 1260 1320 tgggtcacag ccgcgtgccg cgggtacgcg cagaagaatg ttgcgaattc ataaacgtca 1380 accacccgcc ggaacgctgt tacgatttca aaatgtgcaa tcgcttcacc gtcgcgtacg tattttcatg attgtctgcg ttctgtggtg cgtctggatt tgtctctcga cgtttctgat 1440 agccatgttc catcgacgat cctcgggaat gccagagtag attttcatga atccacaggc 1500 1560 tgcggtgtcc ggacggcgaa gtctgctaca gtcccgagaa aacggctgag attcgcggga 1620 tegteaceae catgacecat teattgacae gecaggtegt acaeaacaaa etgacgaget 1680 gcaactacaa teegtaagte tetteetega gggeettaca geetatggga aagtaagaea 1740 gagggacaaa acatcattaa aaaaaaagtc taatttcacg ttttgtaccc ccccttcccc

tccgtgttgt aggttatacc tcgaagctga cgggcgaata cgctgcggca aagtgaacga 1800
caaggcgcag tacctgctgg gcgccgctgg cagcgttccc tatcgatgga tcaacctgga 1860
atacgacaag ataacccgga tcgtgggcct ggatcagtac ctggagagcg ttaagaaaca 1920
caaacggctg gatgtgtgcc gcgctaaaat gggctatatg ctgcagtgaa taataaa 1977

<210> 59

<211> 1849

<212> DNA

<213> Human cytomegalovirus

<400> 59

atgcggctgt gtcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60 120 cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 180 tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagaggtga 240 300 qqqtacqcqc taaaqqtqta tgacaacqqq aaqqtaaqqq cqaacqqqta acqqqtagqt 360 aaccgcatgg ggtgtgaaat gacgttcgga acctgtgctt gcagaatcaa cgtgaccgag 420 gtgtcgttgc tcatcagcga ctttagacgt cagaaccgtc gcggcggcac caacaaagg 480 accacgttca acgccgccgg ttcgctggcg cctcacgccc ggagcctcga gttcagcgtg 540 cggctctttg ccaactagcc tgcgtcacgg gaaataatat gctacggctt ctgcttcgtc 600 accactttca ctgcctgctt ctgtgcgcgg tttgggcaac gccctgtctg gcgtctccgt 660 ggttcacgct aacggcgaac cagaatccgt ccccgccatg gtctaaactg acgtatccca 720 aaccgcatga cgcggcgacg ttttactgtc cttttctcta tccctcgccc ccacggtccc 780 cctcqcaatt cccqqqqttc caqcqqqtat caacqqqtcc cqaqtqtcqc aacqaqaccc 840 tgtatctgct gtacaaccgg gaaggccaga ccttggtgga gagaagctcc acctgggtga 900 aaaaggtgat ctggtatctg agcggtcgca atcagaccat cctccaacgg atgccccgaa cggcttcgaa accgagcgac ggaaacgtgc agatcagcgt ggaagacgcc aagatttttg 960 1020 gagegeacat ggtgeecaag cagaceaage tgetaegttt egtegteaae gatggeacae gttatcagat gtgtgtgatg aaactggaga gctgggccca cgtcttccgg gactacagcg 1080 1140 tgtcttttca ggtgcgattg acgttcaccg aggccgataa ccagacttac accttctgca 1200 cccatcccaa tctcatcgtt tgagcccgtc gcgcgcgcag ggaattttga aaaccgcgcg

tcatgagtcc caaaaacctg acgccgttct tgacggcgtt gtggctgcta ttgggtcaca	1260
gccgcgtgcc gcgggtacgc gcagaagaat gttgcgaatt cataaacgtc aaccacccgc	1320
cggaacgctg ttacgatttc aaaatgtgca atcgcttcac cgtcgcgtac gtattttcat	1380
gattgtctgc gttctgtggt gcgtctggat ctgtctctcg acgtttctga tagccatgtt	1440
ccatcgacga tcctcgggaa tgccagagta gattttcatg aatccacagg ctgcggtgtc	1500
cggacggcga agtctgctac agtcccgaga aaacggctga gattcgcggg atcgtcacca	1560
ccatgaccca ttcattgaca cgccaggtcg tacacaacaa actgacgagc tgcaactaca	1620
atccgttata cctcgaagct gacgggcgaa tacgctgcgg caaagtgaac gacaaggcgc	1680
agtacctgct gggcgccgct ggcggcgttc cctatcgatg gatcaacctg gaatacgaca	1740
agatageceg gategtggge etggateagt acetggagag egttaagaaa cacaaaegge	1800
tggatgtgtg ccgcgctaaa atgggctata tgctgcagtg aataataaa	1849

<210> 60

<211> 240

<212> DNA

<213> Human cytomegalovirus

<400> 60

atgcggctgt gtcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60
cagcgggaga ccgcagaaaa aaacgattat taccgagtac cgcattactg ggacgcgtgc 120
tctcgcgcgc tgcctgacca aacccgttac aagtatgtgg aacagctcgt ggacctcacg 180
ttgaactacc actacgatgc gagccacggc ttggacaact ttgacgtgct caagaggtga 240

<210> 61

<211> 79

<212> PRT

<213> Human cytomegalovirus

<400> 61

Met Arg Leu Cys Arg Val Trp Leu Ser Val Cys Leu Cys Ala Val Val 1 5 10 15

Leu Gly Gln Cys Gln Arg Glu Thr Ala Glu Lys Asn Asp Tyr Tyr Arg
20 25 30

Val Pro His Tyr Trp Asp Ala Cys Ser Arg Ala Leu Pro Asp Gln Thr 35 40 45

Arg Tyr Lys Tyr Val Glu Gln Leu Val Asp Leu Thr Leu Asn Tyr His 50 55 60 Tyr Asp Ala Ser His Gly Leu Asp Asn Phe Asp Val Leu Lys Arg 65 <210> 62 <211> 180 <212> DNA <213> Human cytomegalovirus <400> 60 atgagteeca aaaacetgae geegttettg aeggegttgt ggetgetatt gggteaeage cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120 gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcgtacgt attttcatga 180 <210> 63 <211> 59 <212> PRT <213> Human cytomegalovirus <400> 63 Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu 10 Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu 20 25 30 Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met 35 40 Cys Asn Arg Phe Thr Val Ala Tyr Val Phe Ser <210> 64 <211> 515 <212> DNA <213> Human cytomegalovirus <400> atgagtecca aaaacetgae geegttettg aeggegttgt ggetgetatt gggteaeage 60 cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120

gaacgctgtt	acgatttcaa	aatgtgcaat	cgcttcaccg	tcgcactgcg	gtgtccggac	180
ggcgaagtct	gctacagtcc	cgagaaacgg	ctgagattcg	cgggatcgtc	accaccatga	240
cccattcatt	gacacgccag	gtcgtacaca	acaaactgac	gagctgcaac	tacaatctgt	300
tatacctcga	agctgacggg	cgaatacgct	gcggcaaagt	gaacgacaag	gcgcagtacc	360
tgctgggcgc	cgctggcagc	gttccctatc	gatggatcaa	cctggaatac	gacaagataa	420
cccggatcgt	gggcctggat	cagtacctgg	agagcgttaa	gaaacacaaa	cggctggatg	480
tgtgccgcgc	taaaatgggc	tatatgctgc	agtga			515

<210> 65

<211> 171

<212> PRT

<213> Human cytomegalovirus

<400> 65

Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu 1 5 10 15

Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu 20 25 30

Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met 35 40 45

Cys Asn Arg Phe Thr Val Ala Leu Arg Cys Pro Asp Gly Glu Val Cys 50 55 60

Tyr Ser Pro Glu Lys Thr Ala Glu Ile Arg Gly Ile Val Thr Thr Met 65 70 75 80

Thr His Ser Leu Thr Arg Gln Val Val His Asn Lys Leu Thr Ser Cys 85 90 95

Asn Tyr Asn Leu Leu Tyr Leu Glu Ala Asp Gly Arg Ile Arg Cys Gly 100 105 110

Lys Val Asn Asp Lys Ala Gln Tyr Leu Leu Gly Ala Ala Gly Ser Val 115 120 125 Pro Tyr Arg Trp Ile Asn Leu Glu Tyr Asp Lys Ile Thr Arg Ile Val 130 135 140

Gly Leu Asp Gln Tyr Leu Glu Ser Val Lys Lys His Lys Arg Leu Asp 145 150 155 160

Val Cys Arg Ala Lys Met Gly Tyr Met Leu Gln 165 170

<210> 66

<211> 804

<212> DNA

<213> Human cytomegalovirus

<400> 66

atgagtecea aaaacetgae geegttettg aeggegttgt ggetgetatt gggteaeage 60 120 cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg gaacqctqtt acqatttcaa aatqtqcaat cqcttcaccq tcqcqtacqt attttcatqa 180 240 ttgtctgcgt tctgtggtgc gtctggatct gtctctcgac gtttctgata gccatgttcc 300 atcgacgatc ctcgggaatg ccagagtaga ttttcatgaa tccacaggct gcggtgtccg 360 gacggcgaag tctgctacag tcccgagaaa acggctgaga ttcgcgggat cgtcaccacc atgacccatt cattgacacg ccaggtcgta cacaacaaac tgacgagctg caactacaat 420 480 ccgtaagtct cttcctcgag ggccttacag cctatgggaa agtaagacag agggacaaaa 540 catcattaaa aaaaaagtct aatttcacgt tttgtacccc cccttcccct ccgtgttgta 600 ggttatacct cgaagctgac gggcgaatac gctgcggcaa agtgaacgac aaggcgcagt acctgctggg cgccgctggc ggcgttccct atcgatggat caacctggaa tacgacaaga 660 720 tagcccggat cgtgggcctg gatcagtacc tggagagcgt taagaaacac aaacggctgg 780 atgtgtgccg cgctaaaatg ggctatatgc tgcagtgaat aataaaatgt gtgtttgtcc 804 gaaatacgcg ttttgagatt tctg

<400> 67

atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60

<210> 67

<211> 685

<212> DNA

<213> Human cytomegalovirus

cgcgtgccgc gggtacgcg	c agaagaatgt	tgcgaattca	taaacgtcaa	ccacccgccg	120
gaacgctgtt acgatttca	a aatgtgcaat	cgcttcaccg	tcgcgtacgt	attttcatga	180
ttgtctgcgt tctgtggtg	c gtctggatct	gtctctcgac	gtttctgata	gccatgttcc	240
atcgacgatc ctcgggaat	g ccagagtaga	ttttcatgaa	tccacaggct	gcggtgtccg	300
gacggcgaag tctgctaca	g tcccgagaaa	acggctgaga	ttcgcgggat	cgtcaccacc	360
atgacccatt cattgacac	g ccaggtcgta	cacaacaaac	tgacgagctg	caactacaat	420
ccgttatacc tcgaagctg	a cgggcgaata	cgctgcggca	aagtgaacga	caaggcgcag	480
tacctgctgg gcgccgctg	g cggcgttccc	tatcgatgga	tcaacctgga	atacgacaag	540
atagcccgga tcgtgggcc	t ggatcagtac	ctggagagcg	ttaagaaaca	caaacggctg	600
gatgtgtgcc gcgctaaaa	t gggctatatg	ctgcagtgaa	taataaaatg	tgtgtttgtc	660
caaaaaaaaa aaaaaaaaa	a aaaaa				685

<210> 68 <211> 180 <212> DNA <213> Human cytomegalovirus

<400> 68
atgagtccca aaaacctgac gccgttcttg acggcgttgt ggctgctatt gggtcacagc 60
cgcgtgccgc gggtacgcgc agaagaatgt tgcgaattca taaacgtcaa ccacccgccg 120
gaacgctgtt acgatttcaa aatgtgcaat cgcttcaccg tcgcgtacgt attttcatga 180

<210> 69 <211> 59 <212> PRT <213> Human cytomegalovirus

<400>

69

Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu 1 5 10 15

Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu 20 25 30

Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met 35 40 45

Cys Asn Arg Phe Thr Val Ala Tyr Val Phe Ser 50 55

<210> 70 <211> 780 <212> DNA <213> Human cytomegalovirus				
<400> 70 atgagtccca aaaacctgac gccgttcttg	acggcgttgt	ggctgctatt	gggtcacagc	60
cgcgtgccgc gggtacgcgc agaagaatgt	tgcgaattca	taaacgtcaa	ccacccgccg	120
gaacgctgtt acgatttcaa aatgtgcaat	cgcttcaccg	tcgcgtacgt	atttttatga	180
ttgtctgcgt tctgtggtgc gtctggattt	gtctctcgac	gtttctgata	gccatgttcc	240
atcgacgatc ctcgggaatg ccagagtaga	ttttcatgaa	tccacaggct	gcggtgtccg	300
gacggcgaag tctgctacag tcccgagaaa	acggctgaga	ttcgcgggat	cgtcaccacc	360
atgacccatt cattgacacg ccaggtcgta	cacaacaaac	tgacgagctg	caactacaat	420
ccgtaagtct cttcctcgag ggccttacag	cctatgggaa	agtaagacag	agggacaaaa	480
catcattaaa aaaaaagtct aatttcacgt	tttgtacccc	cccttcccct	ccgtgttgta	540
ggttatacct cgaagctgac gggcgaatac	gctgcggcaa	agtgaacgac	aaggcgcagt	600
acctgctggg cgccgctggc agcgttccct	atcgatggat	caacctggaa	tacgacaaga	660
taacccggat cgtgggcctg gatcagtacc	tggagagcgt	taagaaacac	aaacggctgg	720
atgtgtgccg cgctaaaatg ggctatatgc	tgcagtgaat	aataaaatgt	gtgtttgtcc	780
<210> 71 <211> 529 <212> DNA <213> Human cytomegalovirus				
<400> 71 atgagtccca aaaacctgac gccgttcttg	acggcgttgt	ggctgctatt	gggtcacagc	60
cgcgtgccgc gggtacgcgc agaagaatgt				120
gaacgctgtt acgatttcaa aatgtgcaat				180
ggcgaagtct gctacagtcc cgagaaaacg				240
acccattcat tgacacgcca ggtcgtacac				300
		- 9 - 9 - 9 - 9 - 9 -		

360

ttatacctcg aagctgacgg gcgaatacgc tgcggcaaag tgaacgacaa ggcgcagtac

ctgctgggcg ccgctggca	g cgttccctat	cgatggatca	acctggaata	cgacaagata	420
acccggatcg tgggcctgg	a tcagtacctg	gagagcgtta	agaaacacaa	acggctggat	480
gtgtgccgcg ctaaaatgg	g ctatatgctg	cagtgaataa	taaaatgtg		529
<210> 72 <211> 515 <212> DNA <213> Human cytomeg	alovirus			÷	
<400> 72 atgagtccca aaaacctga	c gccgttcttg	acggcgttgt	ggctgctatt	gggtcacagc	60
cgcgtgccgc gggtacgcg	c agaagaatgt	tgcgaattca	taaacgtcaa	ccacccgccg	120
gaacgctgtt acgatttca	a aatgtgcaat	cgcttcaccg	tcgcactgcg	gtgtccggac	180
ggcgaagtct gctacagtc	c cgagaaacgg	ctgagattcg	cgggatcgtc	accaccatga	240
cccattcatt gacacgcca	g gtcgtacaca	acaaactgac	gagctgcaac	tacaatctgt	300
tatacctcga agctgacgg	g cgaatacgct	gcggcaaagt	gaacgacaag	gcgcagtacc	360
tgctgggcgc cgctggcag	c gttccctatc	gatggatcaa	cctggaatac	gacaagataa	420
cccggatcgt gggcctgga	t cagtacctgg	agagcgttaa	gaaacacaaa	cggctggatg	480
tgtgccgcgc taaaatggg	c tatatgctgc	agtga			515
<210> 73 <211> 171 <212> PRT <213> Human cytomeg <400> 73	alovirus				
Met Ser Pro Lys Asn 1 5	Leu Thr Pro	Phe Leu Thr 10	Ala Leu Tr	Leu Leu 15	

Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu

Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met

Cys Asn Arg Phe Thr Val Ala Leu Arg Cys Pro Asp Gly Glu Val Cys

Tyr Ser Pro Glu Lys Thr Ala Glu Ile Arg Gly Ile Val Thr Thr Met 65 70 75 80

Thr His Ser Leu Thr Arg Gln Val Val His Asn Lys Leu Thr Ser Cys 85 90 95

Asn Tyr Asn Leu Leu Tyr Leu Glu Ala Asp Gly Arg Ile Arg Cys Gly 100 105 110

Lys Val Asn Asp Lys Ala Gln Tyr Leu Leu Gly Ala Ala Gly Ser Val 115 120 125

Pro Tyr Arg Trp Ile Asn Leu Glu Tyr Asp Lys Ile Thr Arg Ile Val 130 135 140

Gly Leu Asp Gln Tyr Leu Glu Ser Val Lys Lys His Lys Arg Leu Asp 145 150 155 160

Val Cys Arg Ala Lys Met Gly Tyr Met Leu Gln 165 170

<210> 74

<211> 1977

<212> DNA

<213> Human cytomegalovirus

<400> 74

qtctqcaaca tqcqqctqtq tcqqqtqtqq ctqtctqttt gtctgtgcgc cgtggtgctg 60 ggtcagtgcc agcgggagac cgcagaaaaa aacgattatt accgagtacc gcattactgg 120 gacgcgtgct ctcgcgcgct gcctgaccaa acccgttaca agtatgtgga acagctcgtg 180 qacctcacqt tqaactacca ctacqatqcq agccacqqct tqqacaactt tqacqtqctc 240 300 aagaqqtqaq qqtacqcqct aaaqgtgtat gacaacggga aggtaagggc gaacgggtaa cgggtaggta accgcatggg gtgtgaaatg acgttcggaa cctgtgcttg cagaatcaac 360 gtgaccgagg tgtcgttgct catcagcgac tttagacgtc agaaccgtcg cggcggcacc 420 480 aacaaaaqqa ccacqttcaa cgccgccggt tcgctggcgc ctcacgcccg gagcctcgag ttcagcgtgc ggctctttgc caactagcct gcgtcacggg aaataatatg ctacggcttc 540 600 tgcttcgtca ccactttcac tgcctgcttc tgtgcgcggt ttgggcaacg ccctgtctgg cgtctccqtq gttcacgcta acggcgaacc agaatccgtc cccgccatgg tctaaactga 660

cgtatcccaa	accgcatgac	gcggcgacgt	tttactgtcc	ttttctctat	ccctcgcccc	720
cacggtcccc	ctcgcaattc	ccggggttcc	agcgggtatc	aacgggtccc	gagtgtcgca	780
acgagaccct	gtatctgctg	tacaaccggg	aaggccagac	cttggtggag	agaagctcca	840
cctgggtgaa	aaaggtgatc	tggtatctga	gcggtcgcaa	tcagaccatc	ctccaacgga	900
tgccccgaac	ggcttcgaaa	ccgagcgacg	gaaacgtgca	gatcagcgtg	gaagacgcca	960
agatttttgg	agcgcacatg	gtgcccaagc	agaccaagct	gctacgtttc	gtcgtcaacg	1020
atggcacacg	ttatcagatg	tgtgtgatga	aactggagag	ctgggcccac	gtcttccggg	1080
actacagcgt	gtcttttcag	gtgcgattga	cgttcaccga	ggccaataac	cagacttaca	1140
ccttctgcac	ccatcccaat	ctcatcgttt	gagcccgtcg	cgcgcgcagg	gaattttgaa	1200
aaccgcgcgt	catgagtccc	aaaaacctga	cgccgttctt	gacggcgttg	tggctgctat	1260
tgggtcacag	ccgcgtgccg	cgggtacgcg	cagaagaatg	ttgcgaattc	ataaacgtca	1320
accacccgcc	ggaacgctgt	tacgatttca	aaatgtgcaa	tcgcttcacc	gtcgcgtacg	1380
tattttcatg	attgtctgcg	ttctgtggtg	cgtctggatt	tgtctctcga	cgtttctgat	1440
agccatgttc	catcgacgat	cctcgggaat	gccagagtag _.	attttcatga	atccacaggc	1500
tgcggtgtcc	ggacggcgaa	gtctgctaca	gtcccgagaa	aacggctgag	attcgcggga	1560
tcgtcaccac	catgacccat	tcattgacac	gccaggtcgt	acacaacaaa	ctgacgagct	1620
gcaactacaa	tccgtaagtc	tcttcctcga	gggccttaca	gcctatggga	aagtaagaca	1680
gagggacaaa	acatcattaa	aaaaaagtc	taatttcacg	ttttgtaccc	ccccttcccc	1740
tccgtgttgt	aggttatacc	tcgaagctga	cgggcgaata	cgctgcggca	aagtgaacga	1800
caaggcgcag	tacctgctgg	gcgccgctgg	cagcgttccc	tatcgatgga	tcaacctgga	1860
atacgacaag	ataacccgga	tcgtgggcct	ggatcagtac	ctggagagcg	ttaagaaaca	1920
caaacggctg	gatgtgtgcc	gcgctaaaat	gggctatatg	ctgcagtgaa	taataaa	1977

atgcggctgt gtcgggtgtg gctgtctgtt tgtctgtgcg ccgtggtgct gggtcagtgc 60 cagcgggaga ccgcagaaaa aaaaacgatt attaccgagt accgcattac tgggacgcgt 120

<210> 75

<211> 1620

<212> DNA

<213> Human cytomegalovirus

<400> 75

gctctcgcgc	gctgcctgac	caaacccgtt	acaagtatgt	ggaacagctc	gtggacctca	180
cgttgaacta	ccactacgat	gcgagccacg	gcttggacaa	ctttgacgtg	ctcaagagaa	240
tcaacgtgac	cgaggtgtcg	ttgctcatca	gcgactttag	acgtcagaac	cgtcgcggcg	300
gcaccaacaa	aaggaccacg	ttcaacgccg	ccggttcgct	ggcgcctcac	gcccggagcc	360
tcgagttcag	cgtgcggctc	tttgccaact	agcctgcgtc	acgggaaata	atatgctacg	420
gcttctgctt	cgtcaccact	ttcactgcct	gcttctgtgc	gcggtttggg	caacgccctg	480
tctggcgtct	ccgtggttca	cgctaacggc	gaaccagaat	ccgtccccgc	catggtctaa	540
actgacgtat	cccaaaccgc	atgacgcggc	gacgttttac	tgtccttttc	tctatccctc	600
gcccccacgg	tcccctcgc	aattcccggg	gttccagcgg	gtattaacgg	gtcccgagtg	660
tcgcaacgag	accctgtatc	tgctgtacaa	ccgggaaggc	cagaccttgg	tggagagaag	720
ctccacctgg	gtgaaaaagg	tgatctggca	tctgagcggt	cgcaatcaga	ccatcctcca	780
acggatgccc	cgaacggctt	cgaaaccgag	cgacggaaac	gtgcagatca	gcgtggaaga	840
cgccaagatt	tttggagcgc	acatggtgcc	caagcagacc	aagctgctac	gtttcgtcgc	900
caacgatggc	acacgttatt	agatgtgtgt	gatgaaactg	gagagctggg	cccacgtctt	960
ccgggactac	agcgtgtctt	ttcaggtgcg	attgacgttc	accgaggcca	ataaccagac	1020
ttacaccttc	tgcacccatc	ccaatctcat	cgtttgagcc	cgtcgcgcgc	gcagggaatt	1080
ttgaaaaccg	cgcgtcatga	gtcccaaaaa	cctgacgccg	ttcttgacgg	cgttgtggct	1140
gctattgggt	cacagccgcg	tgccgcgggt	acgcgcagaa	gaatgttgcg	aattcataaa	1200
cgtcaaccac	ccgccggaac	gctgttacga	tttcaaaatg	tgcaatcgct	tcaccgtcgc	1260
actgcggtgt	ccggacggcg	aagtctgcta	cagtcccgag	aaaacggctg	agattcgcgg	1320
gatcgtcacc	accatgaccc	attcattgac	acgccaggtc	gtacacaaca	aactgacgag	1380
ctgcaactac	aatctgttat	acctcgaagc	tgacgggcga	atacgctgcg	gcaaagtgaa	1440
cgacaaggcg	cagtacctgc	tgggcgccgc	tggcagcgtt	ccctatcgat	ggatcaacct	1500
ggaatacgac	aagataaccc	ggatcgtggg	cctggatcag	tacctggaga	gcgttaagaa	1560
atacaaacgg	ctggatgtgt	gccgcgctaa	aatgggctat	atgctgcagt	gaataataaa	1620

<210> 76

<211> 645

<212> DNA

<213> Human cytomegalovirus

<100× 76						
<400> 76 atgctacggc	ttctgcttcg	tcaccacttt	cactgcctgc	ttctgtgcgc	ggtttgggca	60
acgccctgtc	tggcgtctcc	gtggttcacg	ctaacggcga	accagaatcc	gtccccgcca	120
tggtctaaac	tgacgtatcc	caaaccgcat	gacgcggcga	cgttttactg	tccttttctc	180
tatccctcgc	ccccacggtc	cccctcgcaa	ttcccggggt	tccagcgggt	atcaacgggt	240
cccgagtgtc	gcaacgagac	cctgtatctg	ctgtacaacc	gggaaggcca	gaccttggtg	300
gagagaagct	ccacctgggt	gaaaaaggtg	atctggtatc	tgagcggtcg	caatcagacc	360
atcctccaac	ggatgccccg	aacggcttcg	aaaccgagcg	acggaaacgt	gcagatcagc	420
gtggaagacg	ccaagatttt	tggagcgcac	atggtgccca	agcagaccaa	gctgctacgt	480
ttcgtcgtca	acgatggcac	acgttatcag	atgtgtgtga	tgaaactgga	gagctgggcc	540
cacgtcttcc	gggactacag	cgtgtctttt	caggtgcgat	tgacgttcac	cgaggccaat	600
aaccagactt	acaccttctg	cacccatccc	aatctcatcg	tttga		645

<210> 77

<211> 214

<212> PRT

<213> Human cytomegalovirus

<400> 77

Met Leu Arg Leu Leu Arg His His Phe His Cys Leu Leu Cys 1 5 10 15

Ala Val Trp Ala Thr Pro Cys Leu Ala Ser Pro Trp Phe Thr Leu Thr 20 25 30

Ala Asn Gln Asn Pro Ser Pro Pro Trp Ser Lys Leu Thr Tyr Pro Lys 35 40 45

Pro His Asp Ala Ala Thr Phe Tyr Cys Pro Phe Leu Tyr Pro Ser Pro 50 55 60

Pro Arg Ser Pro Ser Gln Phe Pro Gly Phe Gln Arg Val Ser Thr Gly 65 70 75 80

Pro Glu Cys Arg Asn Glu Thr Leu Tyr Leu Leu Tyr Asn Arg Glu Gly 85 90 95

Gln Thr Leu Val Glu Arg Ser Ser Thr Trp Val Lys Lys Val Ile Trp
100 105 110

Tyr Leu Ser Gly Arg Asn Gln Thr Ile Leu Gln Arg Met Pro Arg Thr 115 120 125

Ala Ser Lys Pro Ser Asp Gly Asn Val Gln Ile Ser Val Glu Asp Ala 130 135 140

Lys Ile Phe Gly Ala His Met Val Pro Lys Gln Thr Lys Leu Leu Arg 145 150 155 160

Phe Val Val Asn Asp Gly Thr Arg Tyr Gln Met Cys Val Met Lys Leu 165 170 175

Glu Ser Trp Ala His Val Phe Arg Asp Tyr Ser Val Ser Phe Gln Val 180 185 190

Arg Leu Thr Phe Thr Glu Ala Asn Asn Gln Thr Tyr Thr Phe Cys Thr 195 200 205

His Pro Asn Leu Ile Val 210

<210> 78

<211> 214

<212> PRT

<213> Human cytomegalovirus

<400> 78

Met Leu Arg Leu Leu Arg His His Phe His Cys Leu Leu Cys 1 5 10 15

Ala Val Trp Ala Thr Pro Cys Leu Ala Ser Pro Trp Phe Thr Leu Thr 20 25 30

Ala Asn Gln Asn Pro Ser Pro Pro Trp Ser Lys Leu Thr Tyr Pro Lys 35 40 45

Pro His Asp Ala Ala Thr Phe Tyr Cys Pro Phe Leu Tyr Pro Ser Pro 50 55 60

Pro Arg Ser Pro Ser Gln Phe Pro Gly Phe Gln Arg Val Ser Thr Gly 70 75 Pro Glu Cys Arg Asn Glu Thr Leu Tyr Leu Leu Tyr Asn Arg Glu Gly Gln Thr Leu Val Glu Arg Ser Ser Thr Trp Val Lys Lys Val Ile Trp 100 105 Tyr Leu Ser Gly Arg Asn Gln Thr Ile Leu Gln Arg Met Pro Arg Thr 115 120 125 Ala Ser Lys Pro Ser Asp Gly Asn Val Gln Ile Ser Val Glu Asp Ala 130 135 140 Lys Ile Phe Gly Ala His Met Val Pro Lys Gln Thr Lys Leu Leu Arg 155 160 145 150 Phe Val Val Asn Asp Gly Thr Arg Tyr Gln Met Cys Val Met Lys Leu 170 165 Glu Ser Trp Ala His Val Phe Arg Asp Tyr Ser Val Ser Phe Gln Val 185 180 Arg Leu Thr Phe Thr Glu Ala Asn Asn Gln Thr Tyr Thr Phe Cys Thr 195 200 His Pro Asn Leu Ile Val . 210 · <210> 79 <211> 171 <212> PRT <213> Human cytomegalovirus <400> '79 Met Ser Pro Lys Asn Leu Thr Pro Phe Leu Thr Ala Leu Trp Leu Leu 5 15 10 Leu Gly His Ser Arg Val Pro Arg Val Arg Ala Glu Glu Cys Cys Glu 20 25

Phe Ile Asn Val Asn His Pro Pro Glu Arg Cys Tyr Asp Phe Lys Met Cys Asn Arg Phe Thr Val Ala Leu Arg Cys Pro Asp Gly Glu Val Cys Tyr Ser Pro Glu Lys Thr Ala Glu Ile Arg Gly Ile Val Thr Thr Met Thr His Ser Leu Thr Arg Gln Val Val His Asn Lys Leu Thr Ser Cys Asn Tyr Asn Pro Leu Tyr Leu Glu Ala Asp Gly Arg Ile Arg Cys Gly Lys Val Asn Asp Lys Ala Gln Tyr Leu Leu Gly Ala Ala Gly Ser Val Pro Tyr Arg Trp Ile Asn Leu Glu Tyr Asp Lys Ile Thr Arg Ile Val Gly Leu Asp Gln Tyr Leu Glu Ser Val Lys Lys His Lys Arg Leu Asp Val Cys Arg Ala Lys Met Gly Tyr Met Leu Gln